

NEW MODE
OF
TREATING DEAFNESS

YEARSLEY.

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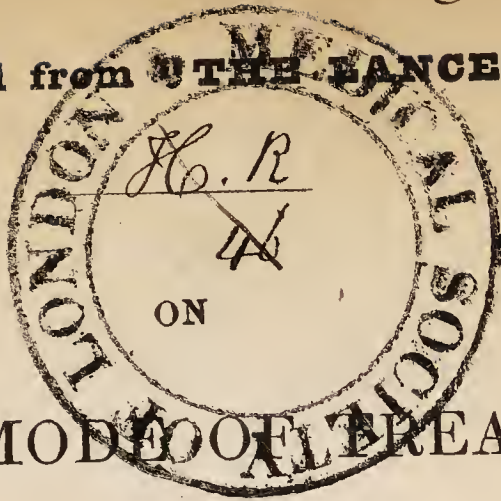
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A NEW MODE OF TREATING DEAFNESS

WHEN ATTENDED BY PARTIAL OR ENTIRE LOSS
OF THE MEMBRANA TYMPANI,

ASSOCIATED OR NOT WITH DISCHARGE FROM THE EAR.

BY

JAMES YEARSLEY, M.R.C.S. ENG.

SURGEON TO THE METROPOLITAN EAR INFIRMARY,
SACKVILLE STREET,

AUTHOR OF "DEAFNESS PRACTICALLY ILLUSTRATED,"
"A TREATISE ON DISEASES OF THE THROAT,"
ETC. ETC. ETC.

LONDON

JOHN CHURCHILL, PRINCES STREET, SOHO.

1852.

A note from a highly respectable physician, printed at page 110, and testifying to the extraordinary efficacy of the New Mode of Treating Deafness described by Mr. Yearsley, will be read with interest by the profession.

We have ourselves seen the remedy applied by Mr. Yearsley in several cases of apparently incurable deafness, and in some of those cases the effect produced appeared to be almost miraculous. This happy discovery establishes for our profession another claim to public gratitude and respect.—*Leading Article of THE LANCET, July 22, 1848.*

Lancet, page 110.—To the Editor of the Lancet.

SIR,—Allow me, through the medium of your journal, to express my deep obligation to Mr. Yearsley for the successful application of his important discovery, in the person of my own son, who, in consequence of his visit to that gentleman this morning, is enabled to enjoy, without effort, the conversation of his friends—an advantage from which he has been debarred for years. I am, Sir, yours faithfully,

CHARLES JAMES FOX, M.D.

30, New Broad Street, City,
July, 1848.

Lancet, page 165.

SIR,—I feel very great pleasure in bearing my testimony to the value of Mr. Yearsley's important discovery in the treatment of Deafness from perforation of the memb. tympani. . . . a discovery which I consider in importance second to nothing which has been brought before the profession for many years.—I am, Sir, your obedient servant,

THOMAS BARRETT,

Bath, July, 1848.

Surgeon to the Bath Ear and Eye Infirmary.

To James Yearsley, Esq.

DEAR SIR,—Having witnessed with the highest satisfaction and delight the happy and most surprising result of your operation upon one of my patients at the Eye and Ear Infirmary, who laboured under deafness from perforation of the drum of the ear, I beg to express to you my warmest thanks, and, at the same time, a sincere hope that you will gratify the profession at large in this town by a public exhibition of this most simple and beautiful application of the art of surgery.—I have the honour to remain, dear Sir, your most obedient servant,

JOHN EDWARDS, M.D.,

One of the Surgeons to the Liverpool Eye and Ear Infirmary.

Liverpool, 153, Duke Street,
Sept. 13, 1849.

Extract from a Letter from Dr. Noggerath, of Brussels, specially engaged in the treatment of Diseases of the Eye and Ear, to James Yearsley, Esq.

I have read with the highest interest an account of your valuable discovery of the artificial tympanum. I had formerly treated the son of my friend, Dr. Alloway, who has been lately under your care, and am delighted to see the immense benefit he has derived from your method of treatment.

Bruxelles, 28, Rue de la Paille,
Sept 4, 1849.

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PREFACE.

WHEN circumstances transpired which appeared to indicate that the time had arrived at which it was incumbent on me to promulgate an important medical fact that I had repeatedly verified in my practice, I considered it to be my first duty to make it known to the profession of which I am a member; and, with this view, I selected a medium through which I believed it would attain great professional publicity—THE LANCET. From that publication the following pages are reprinted, for circulation among those equally entitled to my consideration—namely, patients who, during the last few years, have done me the honour to consult me, many of whom it was my painful duty to pronounce incurable by any measures ordinarily adopted for the relief of Deafness. To these I would recommend a careful perusal of the following pages, for to many of them the new treatment will doubtless afford relief.

Twelve months have now elapsed since the new mode of treatment herein propounded was first made known to the profession. During the previous six years I had frequently proved its value in my practice, but its publication was withheld for reasons

which recent experience shows to have been well founded. Many difficulties beset the inexperienced surgeon in his attempts to use the remedy, and failures have prompted all sorts of deviations from my own well-matured method of applying it, justifying the observations made at pages 9 and 10. Substitutes for water for moistening the cotton have been suggested, such as cod liver oil, glycerine, and other syrupy fluids, all more or less objectionable, on account of their clogging or irritating the passage of the ear, which, if adopted, would inevitably mar the effect of the remedy, however skilfully applied. I firmly believe that cotton wool, moistened with distilled water, warmed to the temperature of the body, will never be superseded.

It is far from my wish to discourage the attempts of others "to place aright these magical bits of wool," but truth compels me to add, that, simple as it would appear, it is an operation requiring the most delicate tact to manipulate with success, which great experience only can confer.

JAMES YEARSLEY.

15, Savile-row, St. James's.

ON A
NEW MODE OF TREATING DEAFNESS,
ETC.

(*Reprinted from the LANCET.*)

UP to the present time, no successful mode of treating perforations of the membrane of the drum of the ear, either as respects the restoration of the membrane, or the relief of the accompanying deafness, has been discovered. The only means resorted to for the latter purpose have been the removal of pus or mucus from the tympanal cavity by syringing, or rendering it free by passing air through the perforation, by way of the Eustachian tube. Either of these proceedings will produce a temporary improvement of the hearing in cases where the tympanum suffers from obstruction, but in many others, when such a state does not obtain, they are of little, if of any service. Another mode of treatment, but one directed to the renovation of the drum, is the employment of mercury, with a view to produce "a new creation of membrane." The translator of Kramer's work (Dr. R. Bennett) has referred to such a case, but it was not attended by results that would justify others in pursuing a similar treatment. In this case, one-fourth of the membrane was gone, but, under the influence of mercury (?) a thin pellicle

extended over the aperture, which led to the hope that an artificial membrane would form. But, in the first place, I believe a patient would be in much better condition, with a loss of one-fourth of the membrane, than with either an artificial membrane or a cicatrix; in the next, I doubt whether the supposed membrane was anything more than a film of mucus, such as frequently fills up a perforation in the drum; at all events, it disappeared as mysteriously as it had formed. The hearing was at first stimulated, but, after the mercurial course, the auditory organ gradually became, as is usual in such cases, more and more torpid.

I have now, however, the extreme gratification of promulgating a mode of relief for deafness attended by loss of the membrana tympani, which will cause great surprise among the readers of *THE LANCET*, not less from its extreme simplicity, than from the extraordinary success which generally attends its employment.

In 1841, a gentleman came from New York, to consult me under the following circumstances:—He had been deaf from an early age, and on examination, I found great disorganization of the drum of each ear. On my remarking this to him, he replied, “How is it, then, that, by the most simple means, I can produce in the left ear a degree of hearing quite sufficient for all ordinary purposes; in fact, so satisfied am I with the improved hearing which I can myself produce, that I only desire your assistance on behalf of the other ear.” Struck by his remark, I again made a careful examination of each ear, and observing their respective conditions, I begged him to show me what he did to that ear, which I should unhesitatingly have pro-

nounced beyond the reach of remedial art. I was at once initiated into the mystery, which consisted of the insertion of a spill of paper, previously moistened at its extremity with saliva, which he introduced to the bottom of the passage, the effect of which, he said, was "to open the ear to a great increase of hearing." This improvement would sometimes continue an hour, a day, or even a week, without requiring a repetition of the manipulation. Such an interesting fact could not fail to excite my attention, and it naturally occurred to me to try so simple a method in other cases. I did so in several which appeared to me to be identical with that of my patient, but I invariably failed. I was on the point of abandoning the idea that the remedy could ever be made available in practice, and of considering either that my American patient's case was unlike all others, or that it depended on some idiosyncrasy, when it happened that a young lady came under my care, by the recommendation of Mr. Squibb, surgeon, of Orchard-street. She was the daughter of wealthy parents, whose anxiety for her relief was so great as to induce them to bring her to me long after I had discouraged their visits, and openly expressed my inability to relieve her. She had become deaf at a very early age, after scarlatina, which had produced disorganization of the drum of each ear, and the deafness was extreme. Unwilling, however, to abandon hope, her friends continued to bring her to me, in order, as they said, that "nothing might be left untried." With little expectation of success, after so many previous failures, I was induced to apply the new remedy, with some modifications upon my previous experiments. Instead of adopting

my American patient's plan, it occurred to me to try the effect of a small pellet of moistened cotton wool, gently inserted and applied at the bottom of the passage, so as to come in contact with the small portion of membrane which still remained. The result was astoundingly successful. On the evening of a day in which she had risen from her bed with the sad reflection that she must be for ever debarred from social converse and enjoyment, she joined the family dinner-party, and heard the conversation which was going on around her with a facility that appeared to all present quite miraculous. Day after day, the remedy was applied with the same marked success, and eventually she learned the art of applying it herself, and thus became independent of me. It was observed that, until the wool could be brought in contact with a particular spot at the bottom of the passage, the hearing was not at all benefited, on the contrary, was prejudiced; but the moment it was properly adjusted on that particular spot, the hearing was restored. Subsequent experience, in a vast number of cases, confirms this remarkable fact. It is not merely necessary to insert moistened cotton wool to the bottom of the passage. Such a manipulation would in most cases add to the deafness. It is essential to find the spot on which to place the wool, and so adjust it as to produce the best degree of hearing of which the case may happen to be susceptible. This of course differs according to the variety and extent of the disorganization.

I quote the above case, not only because it was the first which it was my happiness to relieve by this novel plan, but because I am in a position to show

the permanency of the remedy; for recently I have made it my business to write to the mother of the young lady, who states that her daughter "continues to derive the same benefit as ever from the remedy, and that in her case it has been most successful, restoring her to the charms of society, from which she had been almost entirely excluded. It is now scarcely necessary for the members of her family to raise their voices when addressing her." She adds: "When the aid is removed she scarcely hears at all."

For nearly five years this young lady has used the remedy with undiminished success, and during the same period I have been availing myself of it in the ordinary routine of my practice, stepping neither to the right nor to the left to seek for cases in which it would be applicable, nor ever speaking of its extraordinary success out of the circle of my immediate medical acquaintance. And most probably I should have continued so to do, if it had not happened that a gentleman, an army surgeon, recently consulted me, who having experienced the most happy result from the same mode of treatment, thought proper to publish some account of it in a local newspaper, considering, as he stated, that so important a mode of treatment ought to be more extensively known.

Mr. Griffiths, of Pantgwyn, Newcastle Emlyn, Carmarthenshire, the gentleman in question, (I am at liberty to use his name,) did me the honour to call on me in September of last year, accompanied by Sir David Davies, to consult me about a young friend labouring under an affection of the throat. During the consultation it was necessary for me to raise my voice very considerably to make myself heard by Mr.

Griffiths, and I observed that when he blew his nose, he distinctly passed air through the tympanum. After the consultation, I alluded to his deafness, and the probability, that by a new remedy I could afford him some relief, more especially as he had unconsciously revealed to me, in blowing his nose, a state of ear favourable for success. He readily assented to a trial; and I must be permitted to quote his own statement of the result. On the remedy being applied, he says, "To my utter astonishment I heard every sound so loud, that I felt I had never known what it was to hear until that moment. Sir David Davies could hardly have believed it had he not been present. On entering the streets, the noise was so intense, that I was compelled to stop up my ears to deaden the sound; but after a time I became accustomed to it, and can now enjoy the pleasures of social converse without straining my auricular organs, or being obliged to be addressed in a considerable elevation of voice. Personally I continue to apply the remedy with the same beneficial effect, and am convinced of its permanent nature, when persevered in, and properly attended to. This extraordinary discovery comes too late to be of that essential service it would have been to me in earlier life, yet it may render the rest of my days more comfortable in my intercourse with the world."

The following brief history of Mr. Griffiths' case, as detailed by himself, is interesting in many points of view:—"The crisis of a severe attack of scarlatina in my infancy was attended by abscesses in both ears, which produced deafness, and a continual discharge of purulent matter, more or less, until I attained my twenty-second year, when the latter ceased. Occa-

sionally concretions of wax formed in the passage, increasing the deafness. These were removed by syringing, after which a thin pellucid fluid would issue from the ears, during which my hearing was much improved, again becoming worse as the discharge ceased. While the discharge lasted, I experienced a slight tenderness in my ears, which also ceased with the discharge. I find that your remedy sometimes does the same thing, and that is my reason for not constantly using it; but if it is *not* applied, my hearing is not in the least degree remedied! The discharge is always more profuse when in bed, even without the remedy, and I am somewhat puzzled to account for it. My children know as well as I do when the remedy is applied; and when it is, they remark, ‘Your ears are too sharp; we cannot now speak to mamma, even in a whisper;’ but they cannot, more than other people, discover why I should hear so well one day, and the next, perhaps, not better than usual; and the question now is, ‘Have you got your new ears on to-day, papa?’ The invention is invaluable.”

From this communication, written three or four weeks after his visit to town, it appears that the remedy at first set up an irritation in the ear, which occasionally rendered it advisable that it should be discontinued; but now I am enabled to state that such obstacle to its use no longer exists, and that he applies it regularly, uninterruptedly, and with undiminished success.

This case, like the first quoted, proved to be one in which there was a loss of a great portion of the membrana tympani; and I may here observe, that all my

experience tends to show that this is an essential condition of the ear for success. At the present time I can refer to not very far short of two hundred cases, in which the new treatment has been successful, and in all of which more or less perforation or destruction of the membrane exists.

A very small quantity of wool is sufficient. It must be moistened in some fluid without any compression, and gently pushed down the passage with the point of a probe. I have had constructed for the purpose a set of instruments, which are calculated to meet and overcome every difficulty; for I need scarcely say that it is very easy to talk of passing a foreign body down the meatus, but it is not so easily done. Besides, it is not sufficient to merely pass it down to the site of the membrane; but when there, the spot must be found which it is indispensable the wool should occupy and cover; for then only, and not till then, will success attend the application, and the patient regain the hearing.

With a few rules, which, of course, vary with the case, the patient may be taught to manipulate upon himself, and all that is required is, to renew the cotton, night and morning, or morning only. This is quite sufficient to maintain the improved hearing in the intervals.

It will be expected that I should say something of the *modus operandi* of this new application; but I can offer nothing that is conclusive. It has appeared to me in some way or other to supply the place of the lost membrane. The moisture is absolutely necessary to its perfect action; for when the cotton becomes perfectly dry it impedes rather than improves the power of

hearing. Is it possible that moist wool placed at the extremity of the passage can transmit the vibrations of sound in the same manner as the natural membrane, or must we look for some other explanation? However, of its relieving this kind of deafness there can be no doubt. Some may feel incredulous at such simple means producing such brilliant results; but in order to substantiate that which I have now written, I propose, in a future paper, to quote the statements of my patients, appended to histories of their cases.

The question, as to how far this new mode of treatment can be made available in cases in which the membrana tympani remains intact, is now occupying my anxious consideration, and forms the basis of a series of experiments, the result of which at a future time will be made known to the profession.

It has been intimated to me, that although the new mode of treatment has been explained in my last communication, and the cases to which it is at present applicable clearly indicated, yet I have not so fully described the *modus operandi* as to enable others to adopt it with more than a mere chance of success. In answer, I have only to say, that the experience of several years has taught me that it is impossible to convey to others, in words, such explicit directions as shall enable them to manipulate with any degree of certainty. In fact, it was on this account that I have so long held back from publishing any account of the remarkable fact I had observed in my practice. Apart from other considerations, I felt that publicly to ascribe such ex-

traordinary effects to so simple a remedy, would scarcely be credited; and not without reason; for it would naturally be tried in and out of the profession, although I will venture to say, that in not one instance in twenty, however appropriate and well adapted the case might be, would it succeed, solely from ignorance of the rules, the observance of which is essential to success. These rules more especially apply to the discrimination of the case—the preparation of the ear—the size of the pellet of wool—the degree of moisture—the degree of pressure—the precise spot on which to place the wool—under what circumstances to omit it, and when to resume it, &c. &c. In the absence of such knowledge, circumstances might arise by which not only the patient, but the practitioner, would be puzzled, balked, and might possibly do some serious injury. An instance of the kind has lately occurred. A surgeon brought a case to me in which the treatment was successful; and having seen me produce a great improvement in the hearing, he thought he should be able to succeed also, without further assistance. He inserted the wool, but could not reach the necessary spot; and in endeavouring to adjust it, some injury was done, which completely ruined the ear for future treatment. I have never since been able to get the remedy to act in this case. Many instances of the lamentable results of unskilful attempts on the part of patients, as well as practitioners, have since come to my knowledge. But although it is impossible in words to convey all the necessary information, it will at all times afford me great pleasure practically to illustrate the subject before any practitioner who will favour me with a visit.

As I have already shown, the cases in which the new treatment is at present found applicable are those in which there is partial or complete loss of the membrana tympani: such cases are very frequently accompanied by otorrhœa; but whether this symptom be present or not, the remedy may be found successful. Upon this subject of lesions of the membrane, I therefore offer a few remarks:—

Perforation of the membrane of the tympanum may be a congenital malformation, unattended by any discharge, deafness, or greater tendency than usual to disease of the ear. These cases are generally known by the subjects of them being able to pass air through the meatus, by way of the Eustachian tube and tympanum, when the mouth and nose are stopped. Many persons thus situated are able to pass the smoke of tobacco through the ear with a very slight expiratory effort.

Of the morbid causes of perforations, accumulations of matter in the tympanal cavity from acute or chronic inflammatory action are the most frequent. In such cases, the membrane may itself be involved in the inflammatory disease which precedes the suppuration, and the greater part of it may be destroyed, or it may only give way to a limited extent, so as merely to permit the exit of the matter. In the one case, the ossicula frequently remain *in situ*; but in the other, they are commonly detached and expelled, or at all events the manubrium mallei is removed from its natural position in contact with the membrana tympani.

Perforation and loss of membrane may also occur from the extension of disease of the passage to the tym-

panum. In such cases, the disease of the passage in the form of chronic otorrhœa extends itself to the cuticular covering of the membrane of the tympanum, and the fibrous and mucous laminæ of the membrane are gradually eaten through by ulceration, which may be confined to one particular spot, or extend to the whole of its surface.

Loss of membrane is also frequently caused by ulceration in diseases confined to the membrana tympani itself, such as the form of *tympanitis*. It may also occur from blows on the ear and from loud noises, such as the report of artillery. Writers on the ear have generally allowed the latter as a cause of perforation without question, but Kramer stoutly denies that such an accident can ever happen. I am confident that Kramer is wrong in this respect, his opinion being adverse to that of those with most opportunities of judging,—I mean, military and naval surgeons,—besides being opposed to ordinary reason. Panes of glass may be not only loosened and driven out of the window frame, but actually bent and broken by the vibrations caused by a loud report; and to me there seems no difficulty in believing that powerful sounds would, from the facilities for the concentration and conduction of sound possessed by the auricle and meatus, strike more forcibly upon the membrane than upon any other surface whatever, unless one were specially contrived for the purpose. At the same time, I must remark that a great many of the cases which are usually set down both by professional and unprofessional persons as rupture of the tympanum from loud noises, are cases in which the vibratory shock produces instant deafness from its effects on the brain or auditory nerve;

whereas mere rupture of the tympanum would produce but a very slight amount of deafness at the time of the accident. Those cases in which rupture and loss of hearing occur simultaneously are of a more complex kind; there must be not only injury of the membrane, but serious lesion of the auditory nerve. These circumstances, which are probably the sources of Kramer's errors, I may have to refer to again.

Rupture from loud noises generally occurs from sudden reports taking place when they are not anticipated. There is an admirable preservation against this accident in the power we have of voluntarily rendering the tympanum tense, through the means of the ossicula and their muscles. Persons may thus prepare for loud noises by strengthening the drum, and diminishing the intensity of the sound.

There is also the involuntary provision, of a reflex kind, for the safety of the ear when exposed to loud sounds—namely, the tension of the membrane of the tympanum by the small muscles of the ear, in a manner analogous to the closure of the iris by a bright light; but as, in the case of the eye, an intense flash of light produces its effects at once upon the retina, before there is time for the reflex closure of the iris; so, in the case of the ear, a great impulse of sound may both paralyze the auditory nerve and rupture the membrana tympani before there is time for the defence of both by the reflex tension of the drum.

When the drum is ruptured by accident, there is always some amount of bleeding from the membrane; when it occurs from blows upon the ear, the hæmorrhage is often so considerable as to escape from the meatus or even from the guttural extremity of the

Eustachian tube; but in such cases the blood is probably effused from other parts besides the membrane. On the other hand, when the membrane is partially or wholly destroyed by disease, there is, as long as the drum remains open, some amount of otorrhœa.

With regard to the interesting question which has been so much debated—Can loss of the membrane be repaired? and to which the negative has commonly been given, one important distinction must be made as a preliminary to its consideration. We must distinguish between those cases in which, from accidental causes, or the pressure of matter, the membrane has been merely perforated without loss of substance, and others in which, from ulceration, the greater part of the membrane has been entirely destroyed.

In the first class of cases I have no hesitation in declaring that nothing is more common than for the membrana tympani to cicatrize. Numbers of persons suffer in their childhood from suppuration in the tympanal cavity and the exit of matter through the membrane, in which in after-life no solution of continuity whatever can be discovered by the most searching examination, but in which there are evidences of cicatrization. In the accidental forms of the affection, the drum frequently closes up perfectly within a few days after its perforation. Some years ago, I was induced to perform numerous operations upon the membrane when in a thickened and semi-cartilaginous state, in which puncturation appeared to offer the only means of procuring relief to the hearing. And in cases where I thus operated, the great difficulty was to keep the membrane open; which, in point of fact, was insuperable. I have performed the operation repeatedly

in the same case, in which relief was afforded after each operation; but after awhile, the wound would cicatrize in spite of all means I could devise to prevent it. One of the last cases thus operated on (for I have long discontinued this operation, as a remedy, *per se*, not to be depended upon) was a lady, brought to me by Dr. Richards, of Bedford-square, in which decided relief was afforded to the patient so long only as the opening could be maintained.* In these cases, it has not been a mere obstruction of the passage or the tympanum, but an actual cicatrization of the membrane.

It was thought by Sir Astley Cooper, who in the commencement of his career paid some attention to diseases of the ear, that loss of the membrana tympani was of little consequence to the hearing, he having seen many cases with loss of membrane, and little perceptible deafness, and many of his patients hearing well after he had performed perforation of the membrane of the drum. Other writers have followed this eminent surgeon in this opinion, while others, and particularly Kramer, have as violently opposed it, and maintained that perforation was invariably followed by a greater or less amount of deafness, according to the extent of the loss of membrane. Itard held the same opinion as Sir Astley Cooper. I believe a modified view must be taken of the question. My own opinion is, that simple loss of the membrane of itself never entails severe deafness; but yet, when taken alone, it often produces a marked diminution of hearing; and sometimes, in consequence.

* Improved instrumentation, of which I shall have to speak when treating specially of artificial perforation, now enables me to trephine the membrane with perfect success.

of the exposure of the mucous membrane of the tympanum and membranæ fenestræ, these structures become diseased to such an extent as to produce extreme deafness. The middle ear cannot be exposed to the air for any length of time without such a result being produced.

There is some difficulty in judging of the influence of the membrana tympani on the hearing; but there can be no doubt that hearing is more acute when it is removed altogether, than when it is thickened and diseased. Its importance has often been calculated from the amount of hearing regained when the membrane has been punctured, under the latter circumstances. This is evidently a fallacious estimate. As Kramer truly remarks, those with loss of membrane may obtain sufficient acuteness for ordinary conversational purposes; but it is by no means equal to the appreciation of the delicate pulsations of sound perceptible by the organ in a state of integrity.

My last communication chiefly consisted of observations on partial or complete loss of the membrana tympani—a condition of the ear indispensable for the successful application of the cotton wool. Internal otorrhœa, or discharge from the cavity of the tympanum through the passage of the ear, is another indication of the appropriateness of the remedy; and upon this subject, therefore, I will also proceed to offer a few remarks.

Internal otorrhœa may appear as the sequela of

either acute or chronic inflammation of the mucous membrane of the tympanum. The seat of the discharge is generally the mucous lining of the tympanum, but occasionally it is produced by the deeper-seated structures of the ear, or the ear may be merely the channel by which matter escapes from the brain or spinal cord, and it has even been known to come from the parotid gland, or the muscles in the vicinity of the ear. In the great majority of cases, the discharge escapes by way of the external passage, but it sometimes passes from the ear through the Eustachian tube into the throat, or by ulceration through the mastoid process.

The term otorrhœa is generally limited to discharges by way of the external passage; but there seems to me to be no valid reason against applying it to all discharges having their origin in the ear itself, whatever may be the channel through which they may obtain their exit. This difficulty, if any, is, however, lessened by the fact, that though discharges may, in the first instance, make their way through the Eustachian tubes or the mastoid bones, these channels rarely, if ever, continue, the membrana tympani becoming affected, and the discharge then establishing itself through the external passage. Respecting the nature of otorrhœal discharges, I consider that no definite classifications of disease can be drawn from the different kinds of matter which escape from the ear, neither do I approve of the division into mucous and purulent otorrhœa which has been commonly made. Almost all cases of otorrhœa supervening on acute inflammation, are at first purulent, but as they proceed and acquire a chronic character, the discharge generally becomes muciform, and sometimes appears to consist of pure mucus. On the other

hand, otorrhœa, which attends chronic inflammation, and which comes on very gradually, is almost always of a mucous or muco-purulent kind at first; but if its progress be watched, it will be found that as it goes on the matter becomes puriform. These changes from one kind of discharge to another are so constant, that no arbitrary division of otorrhœa can be fairly made. When we see a case for the first time, and find it discharging either pure pus, or mucus, or a thin serous fluid, we cannot adopt a separate mode of treatment to the different states, for a few days after the nature of the discharge may be entirely reversed, either from external causes, or the state of the patient's health. In all ordinary cases, the discharge is secreted from the mucous membrane of the tympanum, or the degenerated cuticular lining of the passage, in the same manner as any other discharge from a mucous surface—bronchorrhœa, or bronchitis, for example. There is not necessarily, nor even generally, any ulceration of the secreting surface. These conditions explain the variable nature of the discharge, it being well known that the mucous membranes may, without solution of their continuity, secrete every variety of matter, from pus to ordinary mucus.

The state of the membrana tympani and of the ossicula is always a matter of importance in ear discharges. Kramer thought that the membrana tympani never ulcerated, unless from independent disease of the membrane itself; but to me this opinion is very questionable. In a great many cases the perforation of the tympanum simply results from the presence of pus, or some other accumulation of matter, in the cavity of the drum, just as perforation of the skin attends the

presence of pus or any foreign body beneath the cutaneous tissues. In otorrhœa we may find the tympanum either perforated or entirely destroyed by the same amount of internal disease. As I have already stated, the membrane, according to my experience, may cicatrize when even large portions have ulcerated. The state of the membrane necessarily exerts considerable influence over the ossicula, as, when wholly destroyed, they lose the support derived from the attachment of the handle of the malleus. Hence they are more likely, during the progress of the otorrhœa, to become loosened from each other, and discharged through the external passage. The whole of the membrana tympani may disappear, and the malleus and incus become dislocated from the membrane and from the stapes, and in some cases no greater deterioration of hearing occurs than in simple otorrhœa; but the loss of the stapes, from its connexion with the labyrinth, is of the gravest importance in regard to the sense of hearing, producing, in fact, total deafness to all sounds not in immediate contact with the solid parts of the head. This point—namely, that hearing may remain while the stapes continues *in situ*—illustrates a delicate question in the physiology of the human ear. It has been matter of doubt, whether the membrane of the fenestra rotunda is intended for the propagation of sound to the auditory nerve, or to receive the counter-stroke of the wave of sound after it has passed to the labyrinth by way of the ossicula and the membrana fenestræ ovalis. If the membrana fenestræ rotunda were not capable of receiving and transmitting sonorous vibrations from without to the labyrinth, there could be no hearing when the stapes remains fixed to the oval fenestra without any.

attachment externally, it being a law in acoustics, that aëriform vibrations cannot be communicated, except to a very insignificant extent, to a solid body like the stapes. Hence it appears to be an unavoidable inference, that in such cases it is not the stapes which propagates the sound, but the sound membrane. Looking at the stapes, in such circumstances, as merely a mechanical means of guarding the aquaula, the remains of the organ of hearing, consisting of a simple vibratory membrane, (the *membrana fenestræ rotunda*,) covering in a fluid which is in contact with the termini of the auditory nerve, is precisely analogous to the organ of hearing in many of the lower animals.

Other authors have looked on this disease as being extremely formidable, and appear to consider a fatal termination from the extension of disease to the brain as very common. Fortunately, this gloomy view of the subject is not warranted, at all events in this country, by the results of experience. Patients suffering from otorrhœa are at all times liable to the supervention of disease; but its actual occurrence is extremely rare; and when it does appear, it is usually in scrofulous constitutions, or in persons of irregular habits.

The treatment of internal otorrhœa must in principle be the same as that of external otorrhœa, the chief point for additional consideration being the risk of cerebral excitement, or disease from suppression of the discharge. Whenever there is pain in the internal parts of the ear, or when the introduction of a probe into the tympanum gives acute pain, we must resort to local depletion by cupping or leeching behind the ear. If the discharge be immoderate or offensive, a weak injection of the solution of sulphate of zinc may be used, the

same as in *otorrhœa externa*, but during the use of any medicinal application to the middle ear, counter-irritation may be advantageously kept up over the mastoid process, to lessen the tendency to inflammation of the internal structures. Aperients should also be administered. Poultices over the ear at night will be found extremely beneficial. In children, simple measures are often sufficient to arrest the discharge and promote the cicatrization of the membrane; but in adults, or when the discharge has been of long standing, it is exceedingly difficult to make any impression upon it.

When internal *otorrhœa* has become chronic, and the *membrana tympani* seriously diseased, it appears to me, that so long as the discharge is moderate, and the deeper-seated structures of the ear unaffected, if a tolerable amount of hearing remain, the subject of it is in as good a position as regards hearing as is compatible with the nature of such cases. It is found that the use of astringents to the ear, whether they diminish the discharge or not, invariably aggravate the deafness, sometimes causing permanent tinnitus; and even if the discharge cease spontaneously, which it sometimes does, the hearing is always worse than during the discharge. These circumstances, together with the possibility of inducing cerebral inflammation, taken with the fact, that in the great majority of cases, *otorrhœa* remains during the whole life-time without injury to the patient's health, and without annihilating the sense of hearing, are sufficient to make us direct our attention to the preservation of the patient's health, and the maintenance of as great a degree of hearing as possible without the suppression of the discharge. If a good state of health be preserved, and the exciting causes of

ear disease be avoided or guarded against, there is little risk of the fearful termination which attends the spread of the disease inwards to the brain. But as age advances, there is a natural tendency to the suppression of ear discharges of all kinds, and their spontaneous disappearance is rarely, if ever, attended by any ill effects, but the desirability of such a termination is lessened by the increase which takes place in the deafness.

Happily, the moistened cotton-wool now presents itself as a remedy for such cases, and my experience justifies me in saying, that in a very great majority, when skilfully applied, it will materially add to the comfort, gradually lessen the discharge, and vastly improve the state of hearing.

In the relation of cases confirmatory of the happy effects of the cotton-wool, it will be unnecessary to describe with minuteness the precise appearances which each ear presented in which it has been successful; it is sufficient to say, that in every case there was partial or entire loss of the membrana tympani, with more or less otorrhœa, though it is not a *sine quâ non* that the latter symptom of disease should be present. A perfectly dry ear, with perforation of the membrane, may be always considered a highly favourable case for the operation.

The only question we have, therefore, to consider is, how far it is possible that the sense of hearing can be improved by so simple a remedy? and to enable us to form a proper estimate, I propose to quote two descriptions of cases: the one to prove the *permanent* value of the remedy; the other, to show its *immediate* effect.

With respect to the instruments which I use, I may briefly state that they consist of a pair of small forceps, weak in the spring, so as to admit of the blades coming

accurately together with the slightest possible pressure. This instrument should differ from the ordinary forceps in another respect—namely, the blades or prongs should have no roughness at their extremities, and should be so rounded as to act as a common probe when in apposition. The intention of this instrument is of course to introduce the moistened wool to the bottom of the meatus, having done which, they should be disengaged from the wool, and withdrawn. The blades being then brought together, the forceps may be again introduced, acting as a common probe, for the purpose of adjusting the wool on the spot, which, when covered, produces the best degree of hearing of which the case may be susceptible.

An instrument, then, is required for the introduction, the adjustment, and the withdrawal of the wool; and I need scarcely say, that the forceps I have described is sufficient, in dexterous hands, to accomplish these requirements; but I have found that my patients have preferred a separate instrument for the adjustment as well as the withdrawal of the wool. For these purposes, therefore, I have constructed a simple rounded bar of silver, probe-pointed at one extremity, and with a small screw at the other: the one end serves to adjust the wool, the other most surely will entangle and withdraw it.

A few words as to the mode of applying the wool. The practitioner should get a view of the tympanum, and make himself acquainted with the nature and extent of the disorganization. This he will be able to do by the aid of my speculum auris, a description of which appeared in *THE LANCET*, so far back as September, 1839. It is chiefly distinguished from

other specula by having a roughened surface at the extremity of each blade externally, to the extent of a quarter of an inch. The roughened blade clings to the sides of the meatus, and enables the operator to *straighten* as well as to *dilate* the passage, and a much better view is thereby obtained. A small piece of fine wool, differing in size according to the case, and fully moistened in water, is then introduced through the speculum to the bottom of the meatus, and adjusted superiorly, inferiorly, anteriorly, or posteriorly, according to the situation of the perforation and other circumstances connected with the case; but care must be taken that the entire opening be not covered, nor should the wool enter the opening, otherwise the experiment will not succeed. It is also indispensable to success that the moisture of the wool should be preserved; and for the sake of cleanliness, if for no other reason, it should be removed once, at least, during the twenty-four hours.

CASES.

CASE 1.—April 13th, 1845.—Miss —— consulted me in regard to a deafness which, she stated, had commenced in infancy from a neglected cold. There was no predisposition to the malady derived from her family; and, although of a delicate habit of body, she had never suffered from any serious illness. At the time of her visit to me, she was in the enjoyment of good health, but highly nervous and excitable. The deafness was so great, that she could only hear the watch in contact with the ear, and even the loud tick of the metronome could be heard but indistinctly. The tympanum was entirely disorganized; no appearance of healthy membrane could be detected; and a discharge had issued from the passages of the ears from the commencement of the disease.

The passages having been first cleansed of an accumulation of muco-purulent secretion, the pellet of wool was introduced, and, when properly adjusted, a degree of hearing was produced which astonished my patient. The lady who accompanied her conversed with her without difficulty, — sounds which before she had never heard became audible to her; but the improvement in hearing was not more surprising to us, as observers, than the remarkable change it produced in the expression of her countenance. Youthfulness shone out upon a face which had been aged, not by time, but by the anxiety her infirmity had caused her.

The remedy was removed, and the improved hearing was immediately lost. Again the experiment was tried, and again it was successful. The power of the remedy being now well established, it was arranged that she should attend me from day to day, in order that she might be taught to manipulate upon herself. Not being very dexterous in the use of instruments, this occupied about three weeks, when she left me for the seaside. My patient must now be permitted to speak for herself as to the result:—

“ Southshore, Preston, Lancashire, May 27, 1845.

“ DEAR SIR,—I have now been settled in my temporary home a week, and I think you will like to hear what report I can give of myself, and the opinion my friends have formed of the improvement in my hearing. I am happy to say the little trifling daily operation does not continue the same nervous protracted business I found it the first two days. I am much more expert in placing aright your magical remedy, and feel less anxious, from the wonderful success even my own efforts meet with.

. The certainty that I have now the sense of hearing under my own control, as it were, is a blessing most truly appreciated, and I am sure you will believe how completely I must feel in a new world, when my sister and relations at Leamington considered my case not only *improved*, but *cured*. And all my friends, on return here, think I can hear as well as anybody. I am, indeed, sensible of comfort and enjoyment in general society, which I never before experienced, and my chief annoyance now consists in some noises being quite too shrill for me, and general noises attracting my attention, to which I had previously been perfectly dead.

“ To Jas. Yearsley, Esq.”

Having had occasion to visit Bath in January last, I had the satisfaction of seeing this lady, now married and resident there, enjoying all the advantages as at first from the remedy.

CASE 2.—Miss J. J——, aged twenty-eight, has been deaf from childhood; does not remember the early history of her case; believes that many years ago she had a slight discharge from the ears, but during the last three years this symptom of disease has been invariably present; has observed that when the discharge is most profuse she hears the best. Occasionally she experiences a little ear-ach and discomfort about the ears, especially when she takes cold. About four years ago, a considerable

aggravation of the deafness took place, and she then first consulted me. It appears that my attention and treatment were then mainly directed to the state of her throat, under which she considerably improved; but her father dying about that time caused her to discontinue her attendance. In April last, she again applied for my advice, when I observed a condition of the ears favourable for my new treatment. The membrane of the drum of the ear was almost entirely gone on each side. The moistened wool was immediately successful, and the power of the remedy was made evident by omitting it one day and resuming it the next. The result of to-day's visit (April 26) is as follows:—She entered the room *without* the remedy, (for I had intentionally, but unconsciously to her, omitted to apply it the day previously,) and remarked, with much chagrin, that she had been as deaf as ever, since her last visit. I set the metronome going, and directed her to take exact notice of its loudness. At the distance of four yards she heard the tick, but not the bell which is intended to indicate the commencement of a bar of music. She approached close to the instrument, but could not hear the bell. The remedy was applied to the right ear. She was instantly sensible of the difference, and remarked that she now heard the bell as distinctly as before she had heard the tick. In order to get at a correct estimate of the improved hearing, I asked her if she could hear fifty per cent. or one-half better; she replied with confidence, that it must be seventy-five per cent. better.

I am now writing this case in her presence, and in the questions I have to ask her I speak in my ordinary tone of voice, and she does not lose a word.

July 25.—I have this day seen and conversed with this patient, and find, to my great satisfaction, that she is still using the remedy with increased success.

CASE 3.—As we are dealing with the question as to the possible amount of benefit derivable from the new treatment, it may be better that we should quote the state-

ments of patients themselves; and, in selecting these cases, I beg to assure my readers that I am by no means bringing forward the most extraordinary instances of success.

The subject of the following case is housekeeper to a family in Gloucester-place; and, agreeably to my wishes, she has never neglected to report to me on her visit to and departure from town the state of her hearing, which does not appear to have varied from the first to the present moment since the remedy was applied—a period of more than three years. In February last, I requested her to write her own statement of the case, which she did as follows :—

Feb. 10, 1848.

“ It is now three years since I first attended the Ear Institution, in Sackville-street. My deafness was caused by scarlet fever, at the early age of two years. My present age is thirty-six. My left ear recovered for a time, but I lost the hearing again, and I became so deaf that I could not hear a word of conversation. I had advice; and, on being told that the drums of my ears were decayed, I of course gave up all hopes of ever being any better, until a friend advised me to consult Mr. Yearsley. The first time that gentleman saw me, he said he thought he could benefit me by a new remedy. He then applied it, and I immediately found a great difference. On my return home, the noise in the streets quite confused me. On my way to the Institution, the noise of the carriages was dull; but on my return, I could hear the footsteps on the pavement, and caught words from the people as they passed me. My friends, too, were very much pleased and surprised to find how well I could hear. My life is rendered quite comfortable, for I can now hear conversation without being addressed in a loud voice, and all that passes at meals I can hear, whilst before I seldom caught a word.

“ C. J.

“ P.S.—Another great advantage is, that after having

been taught by Mr. Yearsley, I am now able to make use of the remedy myself, without giving trouble to any one."

The following cases will serve to show the *immediate* effects of the treatment:—

June 9th.—Mr. M——, holding an official appointment in the county of Berks, came to consult me for deafness, accompanied by his surgeon, Mr. Maskelyne, of Farringdon. He had been almost totally deaf in the left ear for twenty years, and within the last two years the right ear had become seriously affected. On behalf of the right ear he came to consult me, not supposing for a moment that anything could possibly be done for the left ear. Congestion of the mucous membrane of the throat, no doubt extending along the track of mucous membrane to the right ear, was sufficient to account, in a great measure, for the malady there; but in the left ear there was loss of the membrana tympani and otorrhœa of ancient date. To this ear I first directed my treatment. Prior to the experiment, we carefully tested the degree of hearing it possessed. We found that the sound of the voice could certainly be heard, but it was by the aid of vision only that he could distinguish the articulation and make out what was said. The loud tick of the metronome could not be heard at all. The instantaneous effect of the wool was to enable him to hear even the bell of the metronome, and both Mr. Maskelyne and myself conversed with him without any difficulty. Paragraphs from the newspapers were read to him from the opposite end of the room, and were heard distinctly.

The remedy was removed, and with it all the advantages to hearing as above detailed.

He had come to town only for the day. It was useless, therefore, to reapply it, but it was arranged that he should obtain leave of absence to come again, and learn the art of applying it himself, which he has now done, and the experiment has been this day (July 31st) repeated with the same remarkable effect. In a week or ten days, he will himself be master of the remedy.

[Three other cases are cited from the communications of his correspondents, testifying, equally as the foregoing, to the success of his new plan of treatment; and Mr. Yearsley then goes on to remark:—[*Ed. LANCET.*]

I trust that enough has now been quoted to substantiate that which I have myself written, in respect to the singular fact which it has been my happiness to observe and reduce to practice.

And now it remains to be considered how far it may be in our power, and by what means we can extend the range of its applicability and usefulness, in the discussion of which subject I propose to make some remarks in my next paper, on Artificial Perforation of the Membrana Tympani.*

* This paper appeared in the *LANCET*, Aug. 19, 1848.



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